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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,810	11/13/2001	Debasis Majumdar	82857LMB	5670

7590

02/02/2005

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EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 02/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/008,810

Applicant(s)

MAJUMDAR ET AL.

Examiner

Katarzyna Wyrozebski

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 16, 18-20, 22-46 and 49-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 16, 18-20, 22-46 and 49-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

In view of applicant's request for continued examination following office action is non-final. Applicant's amendment necessitated new search. New prior art is hereby applied and new rejections of record are hereby stated.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 14, 16, 22, 24-28, 29-5, 37-46, 49-51 are rejected under 35 U.S.C. 102(e) as being anticipated by ACQUARULO (US 6,833,392).

ACQUARULO discloses composition comprising clay and block copolymer. One of the block polymers disclosed by ACQUARULO is PEBAX, which is copolymer of nylon and polyether (see examples). PEBAX is a trade name for block copolymer of polyether and polyamide 12, wherein polyamide block has number average molecular weight of 4200 (see attached print out) and polyether block has number average molecular weight of approximately 2000.

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The copolymer is utilized to make nanocomposite with clay such as montmorillonite to form nanocomposite. The amount of clay utilized in the nanocomposite is in a range of 1-10 wt% (col. 2). In col. 3 of the disclosure, ACQUARULO also teaches that clay can be modified with cationic surfactant such as ammonium cations that undergo cationic exchange with clay. The so form nanocomposite is then incorporated into matrix polymer such as polyolefins including polypropylene, polyethylene, polystyrene or polyesters (col. 5).

The composition discloses in ACQUARULO is utilized to make a molded article, wherein applicant's limitation of "for imaging element" is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

In view of the above disclosure, the prior art of ACQUARULO anticipates requirements of claims rejected above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 14, 16, 18-20, 22, 24-35, 37-46, 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over FISHER (US 6,579,927).

The prior art of FISHER discloses composition for nanocomposite material comprising block copolymer, clay and matrix copolymer.

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The block copolymer of FISHER has block (A) compatible with the clay component and block (B) compatible with the matrix resin. According to specification of FISHER, block (A) is of hydrophilic nature and it includes polyethylene oxide (col. 3, lines 40-55). Number average molecular weight of the polyethylene oxide is in a range of 100-5,000 (claim 9).

Structural unit (B) is compatible with matrix polymer and can have the same monomers as the matrix polymer (col. 3, lines 61-66). Specification (col. 4, lines 10-15) discloses polyamides as one of the species of structural unit (B). The number average molecular weight of the polyamide would then be 100-20,000 (claim 9).

The polyether segment of the block or graft co-polymer of the prior art of FISHER has at least 2 monomeric units and polyamide segment has the same or larger amount of monomers as polyether segment. Specification further discloses that the segment (A) contains 5-20 monomeric units (col. 3, lines 56-60). Therefore the ratio between polyether segment and polyamide segment is in a range of 1:1 - 95:1 to 1:1 - 1:95.

The matrix polymer of the prior art of FISHER is selected from polyesters such as polyethylene terephthalate, polyamides, polyolefins such as polyethylene or polypropylene and the like (col. 3, lines 11-25), examples further teach polystyrene.

Clay component of the prior art of FISHER is smectite clay either natural or synthetic and it is selected from clays such as montmorillonite (col. 2, lines 42-54). Clay is utilized in an amount ratio of 0.01-1 to 100:1 with the block copolymer. The ratio of clay to matrix polymer is 1:200 to 2:1 (col. 4, lines 30-34). Based on the ratios depicted by the prior art of FISHER, the amount of matrix polymer is at least 50%.

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In the process of the prior art of FISHER the clay component is first modified with block copolymer and mixed with suitable matrix polymer to form nanocomposite. Intercalation of the block component between the clay platelet is a well-known process, which occurs in this type of reaction and upon shearing action with matrix polymer such clay can further exfoliate (col. 4, lines 45-59). The examples further teach exfoliation, which further means that the clay had to be also intercalated beforehand.

Resulting composition has tensile modulus higher by 10 – 100 % (examples 1 and IV). Since the components of the prior art of FISHER overlap with the components of the present invention in both types of polymers and clays and the amounts, the limitation of the surface resistivity would also overlap.

The prior art of FISHER discloses that already patented composition can be utilized to make any type of molded article.

The composition of the prior art of FISHER discloses PEO/PA block or graft copolymers intercalated in between the clay component and mixed with matrix polymer to form a moldable article.

In the light of the above discussion it would have been obvious for one having ordinary skill in the art at the time of the instant invention to utilize the prior art of FISHER as depicted in the rejection above and thereby obtain the claimed invention. The prior art of FISHER renders the present invention obvious because it teaches and thereby suggests using PEO and PA as block of one copolymer.

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7. Claims 18-20, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over ACQUARULO (US 6,833,392) in view of FISHER (US 6,879,927).

The discussion of the disclosure of the prior art of ACQUARULO from paragraph 2 of this office action is incorporated here by reference.

The difference between the present invention and the disclosure of the prior art of ACQUARULO is more detailed recitation of polyesters as matrix polymers.

The discussion of the disclosure of the prior art of FISHER from paragraph 6 of this office action is incorporated here by reference.

Use of matrix polymers such as polyesters is disclosed in ACQUARULO. The prior art of FISHER, further discloses what type of matrix polyesters can be utilized with block copolymers such as polyether/polyamide block copolymers.

In the light of the above disclosure it would have been obvious to one having ordinary skill in the art at the time of the instant invention to utilize the polyesters of FISHER in the composition of FISHER and thereby arrive at the present invention. Selection of a known material based on its suitability for its intended use supports *prima facie* obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.* 325 U.S. 327, 65 USPQ 297 (1945).

8. Claims 14, 16, 18-35, 37-46, 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'NEIL (WO 01/034685).

The prior art of O'NEIL discloses clay/polymer composite that can be formed into an article by melt blending and extrusion (page 4, lines 25-28). To be more specific, the composition is utilized in soft and tubular article.

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Clay of O'NEIL is Montmorillonite type clay that can be intercalated with ammonium type compounds (page 4, line 15, page 1, line 23).

The intercalating polymer is block copolymers. Example 2 specifically discloses polyamide ether block copolymer. Claims 8 and 9 further teach that the polyamide block is nylon block and the elastomeric block is polyether, polyester and the like. Example 2 of O'NEIL further discloses use of second polymer, which is nylon. Specification on page 5 further teaches use of polyolefins, polyesters and the like.

The composition of O'NEIL can be utilized to make flexible extruded article having improved mechanical properties.

In the light of the above disclosure it would have been obvious to one having ordinary skill to utilize composition of O'NEIL as a base or a substrate and therefore obtain the claimed invention. Above composition can be extruded into flexible material.

In the arguments submitted on 11/26/2004 the applicants argued following:

The examiner would like to confirm receipt of properly filed Terminal Disclaimers. The Double Patenting rejection is hereby overcome.

a) FISHER fails to teach clay intercalated with polyether/polyamide block copolymer.

With respect to the above argument, the prior art of FISHER clearly discloses two blocks A and B. Polyether is clearly depicted as one that can be used for block A and polyamide that can be used for block B.

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b) Fisher fails to teach utility as extruded base for imaging element

With respect to the above argument, the limitation of “for imaging element” is a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

c) FISHER teaches away from the present invention.

With respect to the above argument, the examiner disagrees. The prior art of FISHER in addition to clearly describing polymeric blocks A and B further recited polyesters and polyolefins as matrix resin. It would therefore be obvious to one having ordinary skill in the art to use any of the matrix resins listed by FISHER. Statement that it is possible for the matrix compatible block to have the same monomeric as matrix polymer is only stated as a possibility not a requirement.

Applicant’s argument with respect to the prior art of KARATSUJI is considered moot due to discontinuation of this prior art against present claims.

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d) O'NEIL fails to teach that the polyether/polamide polymer is used as intercalants since clay is already intercalated by another component.

With respect to the above argument, the present invention does not exclude use of additional intercalants. With respect to PE/PA polymer, it is clear from the disclosure of O'NEIL that PE/PA can be viewed as intercalant. It is incorporated into the clay platelets but it does not cause exfoliation of the clay platelets. Clay platelets are exfoliated upon incorporation into polymer matrix and sheer action of the equipment by which they are processed.

e) O'NEIL does not teach utility of the composition in imaging element.

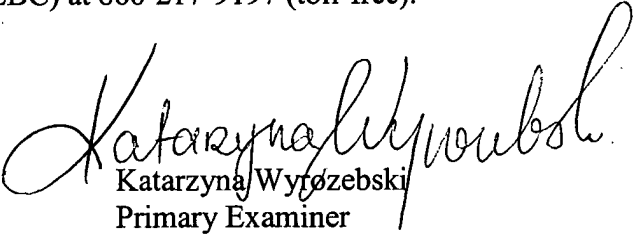
With respect to the above argument, please kindly refer to examiner's position as stated in argument b.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski whose telephone number is (571) 272-1127. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Katarzyna Wyrozebski
Primary Examiner
Art Unit 1714

January 31, 2005